Hurricane Stan: Environmental Impacts from Floods and Mudslides in Guatemala

Results from a Rapid Environmental Assessment in Guatemala

Joint UNEP/OCHA Environment Unit

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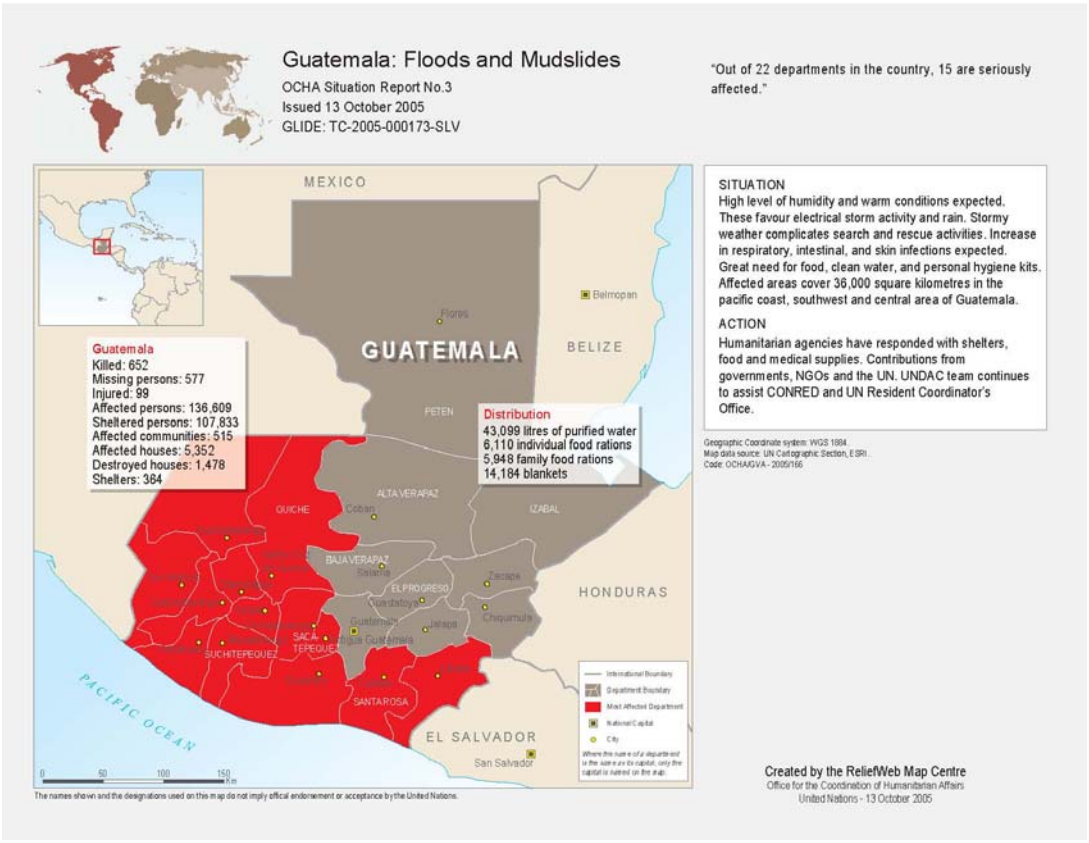
Section 1: Introduction

Overview

This report is intended for decision-makers in Guatemala, potential donors and international community organizations interested in environmental problems arising in Guatemala from Hurricane Stan and subsequent floods and landslides. It is preliminary, based substantially on the findings of an environmental expert operating within the context of the United Nations Disaster Assessment and Coordination (UNDAC) team, in collaboration with the Joint UNEP/OCHA Environment Unit (Joint Unit). It is intended to identify key issues and areas requiring action and/ or further assessment. Some of the information contained in this report has been previously distributed to international partners through situation reports from the United Nations Office for the Coordination of Humanitarian Affairs (OCHA).

Background

As a result of Hurricane "Stan," torrential rainfalls affected the southern coast and western highlands of Guatemala in the period from 4 to 9 October 2005. Flooding and mudslides ensued in many parts of the country, causing loss of life and injury. As of October 21 the death toll stood at 664 while 844 people were still missing. About 430,000 people are directly affected and almost 9000 dwellings had been destroyed.[i] Heavy rainfall continued to cause damage in affected areas. Initially the most affected areas were Escuintla, Jutiapa, Santa



Rosa, Suchitepéquez, San Marcos, Quezaltenango, Huehuetenango, Sololá, Totonicapán, Retalhuleu and El Quiché. The affected areas subsequently grew to 15 departments in Guatemala.

On October 5, the president declared a state of emergency for a period of 30 days. International response included the mobilization of an UNDAC team, multi-disciplinary interagency assistance teams to provide aid to victims, and a Flash Appeal for donor funding. A full description of the international response can be found elsewhere and is not provided here[ii].

The UNDAC team mobilized by the United Nations Office for the Coordination of Humanitarian Affairs on October 9 2005 is a stand-by team of disaster management professionals who are nominated and funded by member governments, OCHA, UNDP and operational humanitarian United Nations Agencies such as WFP, UNICEF and WHO. One of its members is a trained environmental expert who was requested by the Joint Unit to identify any acute environmental issues with potential impacts on human life and health, for example, hazardous materials resulting from damage to industrial facilities, urgent sewage and waste water problems, and key impacts on for example soil and vegetation. The expert conducted his work through meetings with various government ministries, as well as field assessment trips. In-country conditions prevented an in-depth analysis in the time available for the UNDAC mission, and so the findings in this report may only be taken as indicative. The UNDAC mission has been phasing down since 22 October and will end 28 October.

Guatemala has a population of 12 million and covers an area of 108,430 square km, bordering on Mexico to the north, Belize to the northeast and Honduras and El Salvador to the east. The country's geography and social conditions make it vulnerable to the impact of natural disasters: with 54.3% of Guatemala's population living in poverty and 21.5 % in extreme poverty, the reconstruction effort following an emergency situation is challenging[iii]. The country's location on the Pacific Ocean has left it a target for hurricanes, including, in recent years, Hurricane Mitch in 1998, which resulted in 268 deaths, 280 wounded, 121 missing persons and significant damages to infrastructure and the rural environment [iv].

Section 2: Environmental issues and recommendations

General

The majority of losses from the flooding and landslides in Guatemala occurred in rural areas and small villages, in particular due to damage caused to water supplies and basic sanitation, as well as houses and roads[v].

Methodology

The UNDAC team environmental expert conducted a flight over coastal areas including Puerto San Jose, Santa Rosa, and Escuintla; a day field trip to the Department of San Marcos (cities of San Marcos, San Pedro, Malacatan); an evaluation in Retalhuleu to visit the coordination center; and a rapid visit to Quetzaltenango to the distribution and operation center.

He also held three meetings with the Minister of Environment, and provided expert advice to government authorities to assist them in mitigating the worst environmental impacts from the flooding and mudslides. During meetings with government authorities, the environmental expert:

- Proposed that an evaluation be carried out of all immediate environmental threats to the population as well as an additional evaluation of immediate environmental hazards, risks and impacts;
- Encouraged the government to consider some of the debris washed away as recoverable resources rather than garbage; and,
- Suggested the development of a bulletin to inform the population on practical measures to reduce environmental impacts.

The following issues and recommendations follow from these assessments and meetings.

Water

Based on meetings with the Ministry of Environment and conversations with local municipal officers, the quality of surface water is believed to be contaminated from the flooding of sewage and septic systems in many affected areas. Furthermore, flooding and mudslides have increased sedimentation in rivers and drainage systems.

Concerns have also been raised about the possible contamination of groundwater supplies from various sources including animal carcasses, agricultural chemicals (e.g. pesticides), and fuel (e.g. from storage facilities and retail centers).

No water-related sources of infection had been reported as of October 17. However, an initial assessment by the National Water and Sewer Administration determined that 11 million USD is required to repair damaged water infrastructure[vi].

Recommendation: While interagency relief efforts are addressing the immediate needs for safe drinking water, thorough testing of groundwater supplies in affected areas is recommended.

Natural processes and risks

Large soil losses have occurred in many areas, and others are at high risk of further erosion and major soil movements, with potential risks for human lives and agricultural livelihoods. Destruction of forests on a wide scale is not reported. However, in many riverside areas, there is an almost total loss of vegetation, therefore increasing the risks of future erosion and flooding.

Different natural processes affected the different parts of the country. The environmental expert identified risks of floods and accelerated erosion in coastal lowland areas; mud and rockslides in the Boca Costa area; and increased landslide risks in the mountain and highland areas, as described in greater detail in Annex 1. This breakdown can be useful for developing appropriate recovery strategies.

Recommendation: A more thorough assessment of areas of major erosion and areas where major soil movement is a risk, needs to be undertaken to identify any 'hotspots' likely to threaten human life or livelihoods. Based on the findings, strategies should be developed for shore and ground stabilization in the areas deemed most at-risk. In some areas, relocation of people and dwellings may need to be considered to reduce risks from future rainfalls. Communication should be established between government authorities and the United Nations Environment Programme to identify any needs for additional technical expertise.

Possible risks from hazardous materials

Flooding and mudslides of the scale that occurred in Guatemala are expected to lead to threats from leaked fuel and the dispersion of pesticides from sites including agrochemical deposits. Government authorities have informed that they are planning to undertake a full environmental assessment to identify whether acute risks exist.

Recommendation: The results of the environmental assessment should be shared with the international community, in particular the United Nations Environment Programme and relevant development agencies in the event that issues requiring additional technical assistance are identified.

Shelter & Waste Management

Over 70,000 people are living in temporary shelter, according to OCHA sources as of October 21. As indicated above, apart from the almost 9,000 dwellings that have been destroyed, over 25,000 dwellings have been affected.[vii] Although people are starting to return to their homes at this point, specifics depend on the nature of impacts in places of origin. Waste management and sanitation concerns in temporary settlements can be expected under these conditions.

Recommendation: The shelter situation should be monitored and evaluated closely, and plans developed to ensure sanitation and adequate waste management. UNHCR has available a range of tools and guidelines which could assist in this respect.

Animal carcasses

The floods and mudslides resulted in significant deaths of livestock and other farm animals, presenting various contamination risks. In previous disasters the government had authorized the burning of animal carcasses but in this instance, requested information on alternative measures to deal with animal carcasses. Working with the Pan American Health Organization, the environmental expert provided international guidelines on carcass disposal, and a decision was taken to attempt to bury carcasses where possible rather than burn them.

Annex 1

Indication of different natural processes, consequences and needs in affected areas.

- The following table indicates the different natural processes that affected various part of the stricken area, and their implications for response and recovery strategies.
- If an issue is not present in this table, it might still constitute a concern.

Region	Dangerous Processes occurred	Key consequences	Greatest needs	Example cities
Coastal Lowlands	Floods, accelerated erosion on river sides	Loss of food, and clothing Damaged bridges Important agricultural losses (in large landholdings)	Shelters: short term Short term food supply Cleaning materials Water and well sanitation	Puerto San José and Chiquimulilla
Boca Costa (piedmont between the coast and the highlands)	Mud and rockslides	Destruction of villages and homes in the valleys. Destroyed bridges Destroyed roads	Long term food supply Long term and short term shelters Water Tractors for cleaning and road repair	Malacatán
Mountains and Highlands	Landslides (both rocks and mudslides) - these processes continue to happen	Home destruction in the sloped terrain Bridges and roads damaged or destroyed Loss of cooking utensils, stoves, etc. Important agricultural losses (in small landholdings)	Short and long term shelters Long term food supply Water wells and pipeline reconstruction Relocation of displaced people to new areas also at risk Tractors for cleaning and road repair	San Marcos

End Notes

[i] Numbers taken from OCHA Situation Report No. 6 Floods and Mudslides Guatemala – 21.10.2005, http://www.reliefweb.int

[ii] See for example information available on http://www.reliefweb.int including OCHA Situation Reports

[iii] Guatemala Flood and Mudslides Flash Appeal, Consolidated Appeal Process, October 2005.

[iv] Guatemala Flood and Mudslides Flash Appeal, Consolidated Appeal Process, October 2005

[v] modified from Guatemala Flood and Mudslides Flash Appeal, Consolidated Appeal Process, October 2005.

[vi] OCHA Situation Report No. 5 17 October 2005 available on http://www.reliefweb.int

[vi] OCHA Situation Report No. 6, 21.October 2005

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